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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES



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Typical Report Citation and Abstract

- ❶ 19970001126 NASA Langley Research Center, Hampton, VA USA
- ❷ **Water Tunnel Flow Visualization Study Through Poststall of 12 Novel Planform Shapes**
- ❸ Gatlin, Gregory M., NASA Langley Research Center, USA Neuhart, Dan H., Lockheed Engineering and Sciences Co., USA;
- ❹ Mar. 1996; 130p; In English
- ❺ Contract(s)/Grant(s): RTOP 505-68-70-04
- ❻ Report No(s): NASA-TM-4663; NAS 1.15:4663; L-17418; No Copyright; Avail: CASI; A07, Hardcopy; A02, Microfiche
- ❼ To determine the flow field characteristics of 12 planform geometries, a flow visualization investigation was conducted in the Langley 16- by 24-Inch Water Tunnel. Concepts studied included flat plate representations of diamond wings, twin bodies, double wings, cutout wing configurations, and serrated forebodies. The off-surface flow patterns were identified by injecting colored dyes from the model surface into the free-stream flow. These dyes generally were injected so that the localized vortical flow patterns were visualized. Photographs were obtained for angles of attack ranging from 10° to 50°, and all investigations were conducted at a test section speed of 0.25 ft per sec. Results from the investigation indicate that the formation of strong vortices on highly swept forebodies can improve poststall lift characteristics; however, the asymmetric bursting of these vortices could produce substantial control problems. A wing cutout was found to significantly alter the position of the forebody vortex on the wing by shifting the vortex inboard. Serrated forebodies were found to effectively generate multiple vortices over the configuration. Vortices from 65° swept forebody serrations tended to roll together, while vortices from 40° swept serrations were more effective in generating additional lift caused by their more independent nature.
- ❽ Author
- ❾ *Water Tunnel Tests; Flow Visualization; Flow Distribution; Free Flow; Planforms; Wing Profiles; Aerodynamic Configurations*

Key

1. Document ID Number; Corporate Source
2. Title
3. Author(s) and Affiliation(s)
4. Publication Date
5. Contract/Grant Number(s)
6. Report Number(s); Availability and Price Codes
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9. Subject Terms

AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 457)

JANUARY 26, 1998

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LIFE SCIENCES (GENERAL)

19980002712 California State Univ., Dept. of Biology and Microbiology, Los Angeles, CA USA

Predicting Photosynthetic Fluxes from Spectral Reflectance of Leaves and Canopies *Final Report*

Gamon, John A., California State Univ., USA; 1997; 12p; In English

Contract(s)/Grant(s): NAGw-3707

Report No.(s): NASA/CR-97-206165; NAS 1.26:206165; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The central hypothesis of this study has been that photosynthetic efficiency and capacity can be predicted from 'physiological reflectance indices' derived from spectral reflectance of leaves and canopies. I have approached this topic with a combination of laboratory and field experiments, and have also explored the potential of deriving a meaningful physiological index from imaging spectrometry (e.g. AVIRIS). A few highlights are presented below. The main emphasis has been on the 'Photochemical Reflectance Index' (PRI), derived from reflectance at 531 nm and 570 nm. Unlike most 'conventional' vegetation indices (e.g. NDVI), PRI changes rapidly both with illumination and physiological state, because it detects the interconversion of xanthophyll cycle pigments, which serve as photoregulatory pigments and control energy distribution for the photosynthetic system. This approach has differed dramatically from most remote sensing in that it has emphasized temporal variation in narrow-band spectral signatures, instead of spatial patterns of broadband indices. Our primary conclusion has been that PRI works well as an index of photosynthetic light-use efficiency at the leaf scale, much in the same way as the fluorescence index DeltaF/Fm. However, unlike DeltaF/Fm which must be measured at close scales, PRI can be sampled at a range of spatial scales, presenting the possibility of monitoring photosynthetic fluxes remotely.

Author

Photosynthesis; Photochemical Reactions; Canopies (Vegetation); Physiology; Reflectance; Remote Sensing; Spectral Signatures; Vegetation

19980002780 Environmental Protection Agency, National Exposure Research Lab., Research Triangle Park, NC USA

Potential Areas of Endocrine Disruptor Exposure Research: From Source to Potential Dose

Vallero, David A., Environmental Protection Agency, USA; 1997; 19p; In English

Report No.(s): PB97-192975; EPA/600/A-97/023; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Since the late 1980's, studies have postulated linkage between exposures to anthropogenic and natural chemical substances and hormonal dysfunction in mammalian and lower level species. These so-called 'endocrine disruptors' are exogenous agents that can interfere with the production, release, transport, metabolism, binding, action or elimination of natural hormones in humans and wildlife, and are responsible for maintaining homeostasis and regulating animals' reproduction and development (Kavlock, et al., 1996). Presently, the U.S. Environmental Protection Agency (EPA) is considering the role of the research community in identifying the risks and exposures of these substances in the environment. This paper highlights important areas of endocrine disruptor exposure research and the manner in which this research can fit within the Agency's risk paradigm, particularly as it relates to human and ecosystem exposure.

NTIS

Hormones; Risk; Endocrinology; Homeostasis; Exposure

19980002862 Baylor Coll. of Medicine, Houston, TX USA

Utilization of Microgravity Bioreactor for Differentiation and Growth of Human Vascular Endothelial Cells *Final Report*

Chen, Chu-Huang, Baylor Coll. of Medicine, USA; Pellis, Neal R., NASA Johnson Space Center, USA; 1997; 7p; In English

Contract(s)/Grant(s): NCC9-36

Report No.(s): NASA/CR-97-113057; NAS 1.26:113057; No Copyright; Avail: CASI; A02, Hardcopy; A01, Microfiche

The goal was to delineate mechanisms of genetic responses to angiogenic stimulation of human coronary arterial and dermal microvascular endothelial cells during exposure to microgravity. The NASA-designed rotating-wall vessel was used to create a three-dimensional culture environment with low shear-stress and microgravity simulating that in space. The primary specific aim was to determine whether simulated microgravity enhances endothelial cell growth and whether the growth enhancement is associated by augmented expression of Basic Fibroblast Growth Factor (BFGF) and c-fos, an immediate early gene and component of the transcription factor AP-1.

Author

Microgravity; Bioreactors; Cardiovascular System; Cells (Biology)

19980003426 Molecular Geodesics, Inc., Cambridge, MA USA

Biomimetic Materials for Pathogen Neutralization *Quarterly Report, 15 Jul. - 15 Oct. 1997*

Ingber, Donald, Molecular Geodesics, Inc., USA; Ezzell, Robert, Molecular Geodesics, Inc., USA; Mikos, Anthony, Rice Univ., USA; Burns, Michael, Science, Math and Engineering, Inc., USA; Oct. 1997; 32p; In English

Contract(s)/Grant(s): MDA972-97-C-0010; DARPA Order E905

Report No.(s): AD-A330326; MGITR-9702; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The goal of this contract is to develop "biomimetic" materials that exhibit the mechanical responsiveness and biochemical processing capabilities of living cells and tissues as protective fabrics that will capture and neutralize biological threat agents and toxins before they enter into the body. The technical approach involves the development of computer-assisted design & manufacturing (CAD/CAM) and polymer chemistry fabrication technologies as well as an optical fiber technology for delivery of germicidal UV radiation. Since the last Progress Report, the CAD/CAM group has designed and fabricated new geodesic scaffolds and tensegrity networks, and have begun to develop proprietary computer-aided engineering software to efficiently test these structures. We have produced prototypes with strut sizes as small as 150 μm in diameter which is significantly smaller than the 250 μm size we described in the last Report. The Polymer Chemistry group at Rice University has fabricated porous hydrogels that bind, retain, and kill pathogenic bacteria. They also have been able to coat conventional BattleDress Overgarments with bioactive hydrogels. Development of a ultraviolet optical fiber system by Science, Math, Engineering Inc. is also currently underway.

DTIC

Biochemistry; Computer Aided Design; Computer Aided Manufacturing; Polymer Chemistry; Optical Fibers; Pathogens; Systems Engineering; Computer Techniques; Cells (Biology)

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AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

19980002484 ManTech Environmental Technology, Inc., Dayton, OH USA

Dichloroacetic Acid Metabolism In Vitro, 1, Investigation of the Factors Influencing Dichloroacetic Acid Metabolism *Interim Report, Apr. 1994 - Apr. 1995*

Mahle, D. A., ManTech Environmental Technology, Inc., USA; Buttler, G. W., ManTech Environmental Technology, Inc., USA; Lipscomb, J. C., ManTech Environmental Technology, Inc., USA; May 1995; 18p; In English

Contract(s)/Grant(s): F33615-90-C-0532; AF Proj. 7757

Report No.(s): AD-A324575; AL/OE-TR-1995-0083; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Dichloroacetic acid (DCA) is a major metabolite of trichloroethylene (TRI), a common groundwater contaminant. Dichloroacetic acid has been reported to cause hepatocarcinomas in rodents. We have shown that DCA metabolism is dependent on a cytosolic protein and, therefore, not P-450 dependent. However, the products of DCA metabolism have not been clearly identified. Initial experiments performed with nuclease and protease ruled out binding of DCA as an explanation for the disappearance of DCA from cytosolic incubations. Experiments were then conducted to determine if a specific cofactor dependence for DCA metabolism existed. Mouse liver cytosol was incubated with either nicotinamide or flavin cofactors at a concentration of 0.9 mM or 0.24-5 mM glutathione (GSH) and with 20.50 $\mu\text{g}/\text{ml}$ DCA for 3 to 20 minutes at 37°C. The incubations were derivatized and analyzed to assess DCA removed from solution. Dichloroacetic acid metabolism increased with increasing concentration of GSH. Mouse liver cytosol was then incubated with 0.1-5 mM diethyl maleate (DEM), TCA or monochloroacetic acid (MCA) and 20-30 $\mu\text{g}/\text{ml}$ DCA for 5-30 minutes at 37 deg C. The same analysis was done to calculate μg DCA removed. While TCA appeared to have no effect of DCA metabolism, MCA and DEM had varying effects on DCA metabolism. Results from this research can be used to support further investigation of the products of DCA metabolism.

DTIC

Ethyl Compounds; Glutathione; Maleates; Metabolism; Metabolites; Nicotinamide; Nuclease; Proteins

19980002526 Texas Univ., Dept. of Basic Science, Houston, TX USA

Anabolic Vitamin D Analogs as Countermeasures to Bone Loss *Final Report*

Li, Wei, Texas Univ., USA; Duncan, Randall L., Indiana Univ. Medical Center, USA; Karin, Norman J., Texas Univ., USA; Farach-Carson, Mary C., Texas Univ., USA; Aug. 19, 1997; 8p; In English

Contract(s)/Grant(s): NIDR-DE-10318

Report No.(s): NASA/CR-97-113066; NAS 1.26:113066; No Copyright; Avail: CASI; A02, Hardcopy; A01, Microfiche

We demonstrated for the first time that vitamin D3 influences the effect of PTH on bone cell calcium ion levels. This is a rapid effect, taking place within seconds/minutes. This may prove to be a critical contribution to our understanding of bone physiology in that these two hormones are among the most potent regulators of bone calcium content and of systemic calcium homeostasis. Together with the data gathered from the study of astronauts exposed to microgravity for extended periods, these observations suggest the interaction of vitamin D3 and PTH as a possible therapeutic target in the treatment of bone loss disorders such as osteoporosis and disuse atrophy. Chronic exposure of cultured osteoblasts to vitamin D, altered the number of voltage-sensitive Ca(+2) channels expressed. Estrogen treatment yielded a similar result, suggesting that there is overlap in the mechanism by which these hormones elicit long-term effects on bone cell calcium homeostasis.

Author

Bones; Cells (Biology); Calcium; Homeostasis; Bone Demineralization; Calciferol

19980002677 Joint Inst. for Nuclear Research, Radiationa and Radiobiological Research Div., Dubna, USSR

Formulas of dose - stochastic radiobiological effect relationship (the first approach) *Formuly zavisimosti doza - stokhasticheskij radiobiologicheskij ehffekt (pervoe priblizhenie)*

Komochkov, M. M., Joint Inst. for Nuclear Research, USSR; 1996; 11p; In Russian

Report No.(s): JINR-R-19-96-323; DE97-622069; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche; US Sales Only; US Sales Only

The analytical model of dose - stochastic effect relationship for biological systems capable of self-defense by the action on them of dangerous factors is presented. The formulas of the relationship are the solutions of the corresponding differential equations assuming an organism protective process by the immune system. The solutions are based on three parameters. The model is verified on the results of epidemiological control for men exposed by ionizing radiation with mortal result in consequence of cancer.

DOE

Biological Effects; Radiation Effects; Radiation Dosage

19980002684 Texas A&M Univ., Inst. of Biosciences and Technology, Houston, TX USA

The Structure and Function of Non-Collagenous Bone Proteins *Progress Report*

Hook, Magnus, Texas A&M Univ., USA; McQuillan, David J., Texas A&M Univ., USA; 1997; 4p; In English

Contract(s)/Grant(s): NCC9-36

Report No.(s): NASA/CR-97-113065; NAS 1.26:113065; No Copyright; Avail: CASI; A01, Hardcopy; A01, Microfiche

The research done under the cooperative research agreement for the project titled 'The structure and function of non-collagenous bone proteins' represented the first phase of an ongoing program to define the structural and functional relationships of the principal noncollagenous proteins in bone. An ultimate goal of this research is to enable design and execution of useful pharmacological compounds that will have a beneficial effect in treatment of osteoporosis, both land-based and induced by long-duration space travel. The goals of the now complete first phase were as follows: 1. Establish and/or develop powerful recombinant protein expression systems; 2. Develop and refine isolation and purification of recombinant proteins; 3. Express wild-type non-collagenous bone proteins; 4. Express site-specific mutant proteins and domains of wild-type proteins to enhance likelihood of crystal formation for subsequent solution of structure.

Author

Crystal Growth; Collagens; Isolation; Osteoporosis; Pharmacology; Purification

19980002691 Washington State Univ., Pullman, WA USA

Comparison of the Effects of Iodine and Iodide on Thyroid Function in Humans *Final Report*

Robison, Linda M., Washington State Univ., USA; Bull, Richard J., Washington State Univ., USA; Sylvester, Paul W., Washington State Univ., USA; Birkenfeld, Paul, Washington State Univ., USA; Lang, Jerome, Washington State Univ., USA; Jun. 01, 1995; 40p; In English

Contract(s)/Grant(s): NAG9-545

Report No.(s): NASA/CR-95-206522; NAS 1.26:206522; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The present experiment in humans failed to confirm the differential effect of I(sub 2) on maintenance of serum T(sub 4) concentrations relative to the effects of I(-) that was observed in prior experiments in rats. The reaction of I(sub 2) with metabolites of thyroid hormones in the intestine that appears responsible for this effect in rats probably also exists at some level in humans. The present results suggest that the concentrations of such metabolites in the human intestinal tract are too small to significantly affect circulating concentration of T(sub 4). However, based on the elevations in TSH, there should be some concern over the potential impacts of chronic consumption of iodine in drinking water.

Author

Thyroid Gland; Serums; Metabolites; Iodine; Intestines; Hormones; Circulation

19980002865 Texas Woman's Univ., Texas Medical Center, Houston, TX USA

Joint Contracture Orthosis (JCO) Final Report

Lunsford, Thomas R., Texas Woman's Univ., USA; Parsons, Ken, Texas Woman's Univ., USA; Krouskop, Thomas, Texas Woman's Univ., USA; McGee, Kevin, Texas Woman's Univ., USA; 1997; 19p; In English

Contract(s)/Grant(s): NCC9-36

Report No.(s): NASA/CR-97-206117; NAS 1.26:206117; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The purpose of this project was to develop an advanced orthosis which is effective in reducing upper and lower limb contractions in significantly less time than currently required with conventional methods. The team that developed the JCO consisted of an engineer, orthotist, therapist, and physician.

Author

Limbs (Anatomy); Human Beings; Human Reactions; Joints (Anatomy); Contraction

19980002925 Atlantic Rim Network, Boston, MA USA

Transatlantic telemedicine summit Final Report, 11 Apr. - 23 Jun. 1997

Barron, James, Atlantic Rim Network, USA; Aug. 1997; 579p; In English; Transatlantic Telemedicine Summit, 20 - 22 May 1997, Boston, MA, USA

Contract(s)/Grant(s): DAMD17-97-1-7217

Report No.(s): AD-A329039; No Copyright; Avail: CASI; A25, Hardcopy; A06, Microfiche

This report contains the proceedings of the Transatlantic Telemedicine Summit held in Boston on 20-22 May 1997. Objectives Met: 1) Convened an historic summit of over 200 Atlantic Rim policy makers, health care practitioners and technology providers capable of leading the development of sustainable, cost effective global telemedicine to discuss critical needs, obstacles faced and recommendations for action. 2) Provided participants with important examples which largely use interoperable, standards-based, scalable building blocks adaptable to the needs of different regions and different clinical specialties without a huge financial investment. 3) Facilitated the development of specific initiatives which can contribute to the development of high quality, affordable health care. Principle Results: Brought together fiercely competitive health care consortiums, vendors and other providers, from different regions, fields and perspectives to participate in frank assessments of telemedicine, experiences and provide a firmer basis for undertaking own activities and engaging in cross national and collaborative projects. Provided a platform for representatives G7 global health care initiatives to meet together for the first time. Enabled US military, European, North American, Latin American and African (and Asian) representatives to address their concerns to a diverse international audience. Significance: Broadened the definition of telemedicine, enhancing the roles of different stakeholders in the making of clinical, policy and technical and business decisions.

DTIC

Telemedicine; Medical Electronics; Medical Equipment; Biotelemetry; Medical Services; Cost Effectiveness; Cost Reduction; Decision Making

19980003299 Department of Energy, Operations Office, Albuquerque, NM USA

Carcinogenesis of Depleted Uranium Fragments Annual Report, 16 Jan. 1995 - 25 Jan. 1996

Hahn, Fletcher F., Department of Energy, USA; Feb. 1996; 32p; In English

Contract(s)/Grant(s): MIPR-95MM5529

Report No.(s): AD-A330150; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Several soldiers from the Gulf War were wounded by depleted uranium (DU)-containing shrapnel. There is concern that DU may be more hazardous than other shrapnel because of its radioactivity and known toxicity to the kidney. The risks associated with the long-term exposure to DU in this form are thought to be low, but are poorly understood. Predictions of risk are necessary to guide the medical management of soldiers with DU-bearing wounds both now and in the future. We are determining the carcinogenicity of radioactive DU fragments in tissues relative to nonradioactive foreign-body fragments and assessing the potential for

renal toxicity of DU fragments by correlating urine and kidney concentrations of U with time after implantation. DU fragments of differing sizes and shapes are being implanted in the subcutis of rodents to compare with results from animals implanted with inert metals. In this way a toxicity ratio can be determined that can be used to predict the expected response in humans from the known response of humans to relatively inert shrapnel. To date, a pilot study has been initiated to determine the important experimental design parameters for studying the foreign-body response using this test system in animals.

DTIC

Carcinogens; Toxicity; Uranium; Radioactivity; Implantation; Experiment Design; Shrapnel; Warfare

19980003300 Systems Research Labs., Inc., Dayton, OH USA

The Effect of Multiple High +Gz Exposure on Male and Female Isometric Strength in Both Rested and Sleepless Conditions Interim Report, Jan. 1996 - Jan. 1997

Tripp, Lloyd D., Jr., Systems Research Labs., Inc., USA; Bolia, Steve, Systems Research Labs., Inc., USA; Chelette, Tamara, Systems Research Labs., Inc., USA; Jan. 1997; 22p; In English

Contract(s)/Grant(s): F41624-95-C-6014; AF Proj. 7184

Report No.(s): AD-A330144; AL-TR-1997-0068; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The inclusion of women into the high performance aircraft community has raised several questions concerning body strength as it relates to cockpit performance and muscular fatigue. This study evaluated isometric strength of men and women pre and post-G exposure in both a rested and sleepless state. Fourteen subjects (8 male and 6 female) took part in a study which evaluated isometric strength pre and post-Gz acceleration using a static ergometer which emulated aircraft controls. Isometric strength measures were obtained pre and post-G acceleration in both rested (8 hours of rest) or sleepless (24 hours no sleep) conditions. G-exposure consisted of flying four (3 minute) closed loop flight simulations in the Dynamic Environment Simulator (centrifuge). No significant changes in strength were observed within groups of men and women when comparing pre-G rested upper and lower body strength measures. There were, however, significant differences between both groups. Women were 53 percent as strong as the men. Despite the significant differences in baseline strength measures between men and women, there were no significant differences in maximum isometric strength post-G acceleration in either the rested or sleepless conditions.

DTIC

Flight Simulation; Muscular Fatigue; Performance Tests; Aircraft Control; Females; Exposure; Feedback Control; Environment Simulators

19980003342 Southwest Foundation for Biomedical Research, San Antonio, TX USA

Developing Novel Conjugate HIV-1 Subunit Therapeutic Vaccines Annual Report, 1 Jun. 1996 - 31 May 1997

Giavedoni, Luis D., Southwest Foundation for Biomedical Research, USA; Jun. 1997; 14p; In English

Contract(s)/Grant(s): DAMD17-95-I-5029

Report No.(s): AD-A330147; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Highly pure, native preparations of recombinant gp120 have been obtained from the T-tropic HIV-1(LAI) and the macrophage-tropic HIV-1(JR-FL) isolates. Conjugates of these HIV-1 gp120 preparations were prepared with tetanus toxoid (TT) and keyhole limpet hemocyanin (KHL) with the hypothesis that very immunogenic carrier proteins will increase the immunogenicity of gp 120.

DTIC

Vaccines; Proteins; Therapy; Macrophages; Conjugates

19980003447 Baylor Coll. of Medicine, Houston, TX USA

Development of Human Muscle Protein Measurement with MRI Final Report

Lin, Chen, Baylor Coll. of Medicine, USA; Evans, Harlan, Baylor Coll. of Medicine, USA; Leblanc, Adrian D., Baylor Coll. of Medicine, USA; Aug. 15, 1997; 23p; In English

Contract(s)/Grant(s): NCC9-36

Report No.(s): NASA/CR-97-113067; NAS 1.26:113067; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

It is known that micro-gravity has a strong influence on the human musculoskeletal system. A number of studies have shown that significant changes in skeletal muscles occur in both space flight and bedrest simulation. In our 5 week bedrest study, the cross-sectional area of soleus-gastrocnemius decreased about 12% while the cross-sectional area of anterior calf muscles decreased about 4%. Using volume measurements, these losses increased after 17 weeks to approximately 30% and 21% respectively. Significant muscle atrophy was also found on the SL-J crew members after only 8 days in space. It is important that these effects are fully understood so that countermeasures can be developed. The same knowledge might also be useful in preventing muscle atrophy related to other medical problems. A major problem with anatomical measurements of muscle during bed rest and

microgravity is the influence of fluid shifts and water balance on the measurement of muscle volume, especially when the exposure duration is short and the atrophy is relatively small. Fluid shifts were documented in Skylab by visual observations of blood vessel distention, rapid changes in limb volume, center of mass measurements and subjective descriptions such as puffy faces and head fullness. It has been reported that the muscle water content of biopsied soleus muscles decreased following 8 hours of head down tilt bed rest. Three aspects of fluid shifts that can affect volume measurements are: first, the shift of fluid that occurs whenever there is a change from upright to a recumbent position and vice versa; second, the potential for fluid accumulation in the lower limbs resulting from muscle damage caused by overextending atrophied muscle or swelling caused by deconditioned precapillary sphincter muscles during reambulation; third, the net change of hydration level during and after bed rest or spaceflight. Because of these transitory fluid shifts, muscle protein is expected to represent muscle capacity better than does muscle volume. The purpose of this study is to test the feasibility of using MRI to quantify of muscle protein and water content changes in muscle.

Author

Aerospace Medicine; Proteins; Microgravity; Musculoskeletal System; Bed Rest; Damage

19980003756 NERAC, Inc., Tolland, CT USA

Toxicology of Dyes Used in the Textile Industry. (Latest citations from World Textile Abstracts)

Feb. 1997; In English

Report No.(s): PB97-855415; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Microfiche

The bibliography contains citations concerning the health hazards of dyes used in the textile industry. Safety measures for dye handling, storage, and application are discussed. Toxicology of vapor and dust from dyes is examined, and suggestions for safe, effective ventilation are made. Studies concerning mutations and cancers caused by dyes are briefly cited, and the scarcity of research in this area is noted. The trend toward increased regulations to control the health and environmental impact of dyes is examined. Effluent treatment of dyes is discussed in another bibliography. (Contains 50-250 citations and includes a subject term index and title list.)

NTIS

Bibliographies; Dyes; Toxicology; Textiles

19980003768 State Univ. of New York, Dept. of Psychology, Stony Brook, NY USA

A Comparison of the Traditional Polygraphic Cardio Measure with Two New Techniques for Continuous Blood Pressure Assessment Final Report, Sep. 1993 - Jan. 1997

Katkin, Edward S., State Univ. of New York, USA; Jan. 1997; 16p; In English

Contract(s)/Grant(s): N00014-94-I-0344

Report No.(s): AD-A330101; DODPI-97-R-0005; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

New technologies for the assessment of blood pressure responses were evaluated to determine if they contribute to increased reliability and validity of detection of deception. The traditional cardio measure was compared with two devices (Finapres and Cortronic) designed to measure blood pressure accurately, unobtrusively, and continuously on each beat of the heart. Electrodermal measures were also taken. Two different experimental paradigms were used - the orienting reaction and the "Stim" test, while continuous physiological measurement was taken on a traditional cardio measure, an electrodermal measure, and both the Finapres and the Cortronic automated blood pressure devices. Data from 28 female and 14 male subjects are reported. The results indicated that the electrodermal measure showed the expected patterns of orienting reaction elicitation and habituation, but that none of the cardiovascular measure yielded any evidence of a systolic or diastolic blood pressure orienting response.

DTIC

Pressure Measurement; Blood Pressure; Galvanic Skin Response; Physiological Tests

19980003822 NERAC, Inc., Tolland, CT USA

Carbon Monoxide Toxicity: Latest citations from the Life Sciences Collection Database

Oct. 1996; In English; Page count unavailable, Supersedes PB96-851704.

Report No.(s): PB97-850523; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Microfiche

The bibliography contains citations concerning the mechanism and clinical manifestations of carbon monoxide (CO) exposure, including the effects on the liver, cardiovascular, and nervous systems. Topics include studies of the carbon monoxide binding affinity with hemoglobin, measurement of carboxyhemoglobin in humans and various animal species, carbon monoxide levels resulting from tobacco and marijuana smoke, occupational exposure and the NIOSH (National Institute for Occupational Safety and Health) biological exposure index, symptomology and percent of blood CO, and intrauterine exposure. Air pollution, tobacco

smoking, and occupational exposure are discussed as primary sources of carbon monoxide exposure. The effects of cigarette smoking on fetal development and health are excluded and examined in a separate bibliography.

NTIS

Bibliographies; Toxicity; Carbon Monoxide; Liver; Cardiovascular System; Nervous System

19980003873 Army Research Lab., Battlefield Environment Directorate, White Sands Missile Range, NM USA

Real-Time Thermal Risk Assessment for the Dismounted Soldier Final Report

McWilliams, Gary, Army Research Lab., USA; Mar. 1997; 41p; In English

Report No.(s): AD-A330443; ARL-TR-1022; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

This report discusses a real-time thermal risk assessment system for the dismounted soldier. This system has been jointly developed by the U.S. Army Research Laboratory and the U.S. Army Research Institute for Environmental Medicine. It is capable of providing work-to-rest ratios, water consumption requirements, and cold survival times that can be used to help prevent soldiers from becoming hyperthermic or hypothermic. The information can be generated over a region the size of a battlefield. The system is comprised of three primary software modules. One module generates high-resolution gridded weather data from any point measurement data available in the region of interest. The other two modules calculate the heat strain and cold survivability parameters. They require the gridded weather data and the data related to the soldier's physical condition, clothing, and activity levels as input. The system is currently undergoing operational test and evaluation at Camp James E. Rudder on Elgin Air Force Base, FL.

DTIC

Armed Forces (USA); Real Time Operation; Temperature Effects; Computer Programs

53

BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

19980002719 Stanford Univ., Dept. of Psychology, Stanford, CA USA

Center of Excellence in Model-Based Human Performance Final Report, 1 May 1984 - 28 Feb. 1997

Wandell, Brian A., Stanford Univ., USA; Jul. 1997; 14p; In English

Contract(s)/Grant(s): NCC2-307

Report No.(s): NASA/CR-97-112983; NAS 1.26:112983; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The Center of Excellence (COE) was created in 1984 to facilitate active collaboration between the scientists at Ames Research Center and the Stanford Psychology Department. As this document will review, over that period of time, the COE served its function well. Funds from the Center supported a large number of projects over the last ten years. Many of the people who were supported by the Center have gone on to distinguished research careers in government, industry and university. In fact, several of the people currently working at NASA Ames were initially funded by the Center mechanism, which served as a useful vehicle for attracting top quality candidates and supporting their research efforts. We are grateful for NASA's support over the years. As we reviewed in the reports for each year, the COE budget generally provided a portion of the true costs of the individual research project. Hence, the funds from the COE were leveraged with funds from industry and other government agencies. In this way, we feel that all parties benefitted greatly from the collaborative spirit and interactive aspects of the COE. The portion of the support from NASA was particularly important in helping members of the COE to set aside the time to publish papers and communicate advances in our understanding of human performance in NASA-related missions.

Author

Human Performance; Psychology; NASA Programs

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MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing. For related information see also 16 Space Transportation.

19980002718 NERAC, Inc., Tolland, CT USA

Workstation Clusters. (Latest citations from the INSPEC Database)

Feb. 1997; In English; Page count unavailable

Report No.(s): PB97-855357; Copyright Waived; Avail: Issuing Activity (Nat'l Technical Information Service (NTIS)), Microfiche

The bibliography contains citations concerning the design, implementation, and performance of workstation clusters. References review workstation architecture, cluster network interface, parallel programming and debugging, parallel computing, multiple and digital simulation, and network operation systems. Applications in scientific and engineering computing, resource management, and power system analyses are discussed. (Contains 50-250 citations and includes a subject term index and title list.)
NTIS

Bibliographies; Workstations; Parallel Processing (Computers)

19980002889 Vanderbilt Univ., Nashville, TN USA

JOVE Pilot Research Study in Astronomy and Microgravity Sciences Final Report, 19 Mar. 1990 - 30 Apr. 1995

Strauss, Alvin M., Vanderbilt Univ., USA; Hmelo, Anthony, Vanderbilt Univ., USA; Peterson, Steven, Vanderbilt Univ., USA; 1996; 5p; In English

Contract(s)/Grant(s): NAG8-151

Report No.(s): NASA/CR-97-112986; NAS 1.26:112986; No Copyright; Avail: CASI; A01, Hardcopy; A01, Microfiche

The purpose of this project was to develop hardware and software facilities for evaluating the biomechanical interactions between human hands and space suit gloves. The first task was to measure finger joint angles inside space suit gloves. A preliminary survey identified three potential systems which could be used in the proposed study. In response to the current market situation, a glove for measuring the positions of the hand inside a space suit has been developed. A prototype of the glove has been constructed to demonstrate its sensing technologies. There are two types of sensors in the glove. The positions of the fingers are measured using bend sensors based on the CyberGlove design. This sensor consists of two strain gages mounted to a 0.003 inch thick mylar sheet. The sensor is encapsulated using 0.001 inch kapton film to give it sufficient rigidity. Along gage is used to average the strain generated in the sensor due to bending. This average strain produces an output signal proportional to the angle of the bend. The force sensor consists of conductive ink sandwiched between two plastic sheets. An electrode is printed on one of the plastic sheets using silver ink. The resistance of the ink is sensitive to pressure.

Author (revised)

Space Suits; Gloves; Biodynamics; Prototypes; Kapton (Trademark)

19980003333 NASA Kennedy Space Center, Cocoa Beach, FL USA

Use of Bioregenerative Technologies for Advanced Life Support: Some Considerations for BIO-Plex and Related Testbeds

Wheeler, Raymond M., NASA Kennedy Space Center, USA; Strayer, Richard F., NASA Kennedy Space Center, USA; Jul. 15, 1997; 32p; In English

Contract(s)/Grant(s): NAS10-12180

Report No.(s): NASA-TM-113229; NAS 1.15:113229; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

A review of bioregenerative life support concepts is provided as a guide for developing ground-based testbeds for NASA's Advanced Life Support Program. Key among these concepts are the use of controlled environment plant culture for the production of food, oxygen, and clean water, and the use of bacterial bioreactors for degrading wastes and recycling nutrients. Candidate crops and specific bioreactor approaches are discussed based on experiences from the Kennedy Space Center Advanced Life Support Breadboard Project, and a review of related literature is provided.

Author

Life Support Systems; Controlled Atmospheres; Oxygen; Farm Crops; Water; Bioreactors; Regeneration (Physiology); Bacteria

19980003471 NASA Johnson Space Center, Houston, TX USA

Habitability and Performance Issues for Long Duration Space Flights

Whitmore, Mihriban, Lockheed Martin Space Mission Systems and Services, USA; McQuilkin, Meredith L., Lockheed Martin Space Mission Systems and Services, USA; Woolford, Barbara J., NASA Johnson Space Center, USA; Oct. 1997; 28p; In English

Contract(s)/Grant(s): NAS9-18800

Report No.(s): NASA/CR-97-112974; NAS 1.26:112974; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Advancing technology, coupled with the desire to explore space has resulted in increasingly longer manned space missions. Although the Long Duration Space Flights (LDSF) have provided a considerable amount of scientific research on human ability to function in extreme environments, findings indicate long duration missions take a toll on the individual, both physiologically and psychologically. These physiological and psychological issues manifest themselves in performance decrements; and could lead to serious errors endangering the mission, spacecraft and crew. The purpose of this paper is to document existing knowledge

of the effects of LDSF on performance, habitability, and workload and to identify and assess potential tools designed to address these decrements as well as propose an implementation plan to address the habitability, performance and workload issues.

Author

Habitability; Workloads (Psychophysiology); Physiology; Manned Space Flight; Long Duration Space Flight

19980003791 NERAC, Inc., Tolland, CT USA

Anthropometry in the Design of Protective Equipment (Latest citations from the NTIS Bibliographic Database)

Nov. 1996; In English; Page count unavailable

Report No.(s): PB97-851349; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Micro-fiche

The bibliography contains citations concerning the utilization of anthropometric measurement techniques in the design and evaluation of protective equipment. Anthropometric measurement in the design and evaluation of helmets, gloves, clothing for air crews, interrelationships between clothing size and cockpit design in aircraft and tanks, restraint system designs including lap belts and harnesses, respirators, airbag restraints, and devices to protect automobile drivers from side impact accidents are among the topics discussed.

NTIS

Bibliographies; Anthropometry; Protective Clothing; Helmets; Gloves; Safety Devices; Safety Management; Evaluation

19980003805 NERAC, Inc., Tolland, CT USA

Anthropometry: Basic Studies and Applications (Latest citations from the NTIS Bibliographic Database)

Oct. 1996; In English; Page count unavailable

Report No.(s): PB97-850945; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Micro-fiche

The bibliography contains citations concerning the utilization of anthropomorphic measurement techniques in the design of military and civilian clothing and equipment. Topics include motion studies, physical fitness surveys, the use of anatomical models, and gender comparisons pertaining to specific anthropometric variables. Aircraft seats and cabins, cockpit design, automobile safety equipment, and flotation devices are among the equipment types considered. Military and civilian population surveys, and recreational products are also discussed.

NTIS

Anthropometry; Bibliographies; Clothing; Armed Forces; Technologies; Anatomy

19980003823 NERAC, Inc., Tolland, CT USA

Human Factors Engineering in Motor Vehicles: Latest citations from the Ei Compendex*Plus Database

Oct. 1996; In English; Page count unavailable, Supersedes PB96-854708.

Report No.(s): PB97-850564; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Micro-fiche

The bibliography contains citations concerning the design and engineering of motor vehicles with regard to ergonomics, man-machine systems, and behavioral research. Design standards by the International Standards Organization (ISO), human tolerance studies related to crash tests, and computer models used for performance and predictive evaluations are discussed. Citations also examine the causes of accidents and injuries including wind, road conditions, noise levels, and other external factors.

NTIS

Bibliographies; Human Factors Engineering; Motor Vehicles; Design Analysis; Man Machine Systems; Standards

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